

Portfolio Risk Management of Islamic Debt Capital Markets (Sukuk)

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Abstract

This study investigates the portfolio risk management of Sukuk and Euro bonds. The study is conducted in five countries including Malaysia, Bahrain, Pakistan, Bermuda and UAE. For each country two portfolios are made, one comprising of both Sukuk and Euro bonds whereas the other portfolio contains only Euro bonds. The evaluation of financial performance is done on the basis of VaR, a risk measurement tool. For this purpose, daily returns data for the bonds Sukuk and Euro, is collected from DataStream. VaR is calculated for each portfolio through Delta normal approach. It is found that inclusion of Sukuk in a portfolio significantly affects the risk level of the portfolio. In case of all the countries included in a sample that is Malaysia, Bahrain, Pakistan, Bermuda and UAE, the VaR value significantly decreased by including Sukuk bond in the portfolio along with the Euro bond. With the inclusion of Sukuk bond in a portfolio along with the Euro bonds, the holdings are diversified (Segaf, 2012; Hassan, 2012; Fenech & Watson, 2009; Godlewski, Ariss & Weill, 2011; Cakir & Raei, 2007).

Keywords: Islamic finance, Sukuk, conventional (Euro) bonds, Value at risk, portfolio management.

Introduction

Islam is a complete religion and it covers each and every aspect of the life. It is the perfect way of life and addresses all sort of problems related to the life. Human beings, by nature, are always in search of perfectness. Among other systems related to their lives, they also try for the best financial system in order to address all the financial issues of the individuals and the society. Islam has given the perfect financial system not now but 1400 years before (Usman and Khan, 2012). From the start of civilization, different modes of saving have been followed and these modes are kept on changing day by day. Among other modes of saving, investment is one of the most common modes of saving. Investment is basically using the funds for the purpose of getting

extra or additional value. There are two meanings of investment one is economic and other is financial. From economic perspective, investment is defined as an activity which generates capital goods and from finance perspective; investment is defined as an activity of selling and purchasing of the assets (Kaptan, 2001).

There are different alternatives for investment like bonds, stocks, real estate etc. Among the bonds, there are two main classifications; Sukuk bonds and Euro bonds (Usmani, 2002). Euro bonds are the general conventional bonds used for investment purposes. Whereas Sukuk are the Islamic financial instruments which provide a new way of investment under the principals of Shariah (Arif and Safari, 2012). According to IIFM (2010) “Sukuk are those commercial papers which provide an investor with opportunity of ownership in an underlying asset”. The initiation of Sukuk bonds has given rise to a new era in the financial world which leads to a novel way of attaining the financial stability (Shaikh and Saeed, 2010).

Sukuk investments are the specific type of securities which are issued by corporate and sovereign entities. They have the features of both the bonds and stocks (Godlewski, Ariss and Weill, 2011). Sukuk has some similarity with conventional bond but it cannot be completely treated as simple bond (Safari, Arif and Muhammad, 2012). These two types of bonds have similarity in a way that they both are traded in secondary market under the same mechanism of trading. In Sukuk, a business gets the right to collect funds in accordance with the principal of Shariah (Safari 2013). According to Safari, Arif and Muhammad (2012), the main difference between Sukuk and conventional bond lie in the nature of financing and Shariah principle which are followed by Sukuk but not by the conventional bonds. There are many similarities between Sukuk and conventional Euro bonds. Like Euro bonds, Sukuk are also the secondary market instruments and provide the predictable return level. They are traded in secondary market lesser than Euro bonds. They are also rated by the international agencies of rating and most of the time cleared under the Euro clear (Cakir and Raei 2007). The popularity of Sukuk bonds among the investors is increasing day by day. In all over the world investors both Muslim and non-Muslim, are inclining toward Sukuk bonds. The inclusion of Sukuk bond in a portfolio significantly decreases the risk level of that portfolio. That’s why Sukuk bonds are getting familiarity outside the Muslim world as well (Segaf, 2012; Hassan,

The basic purpose of this study is to determine any possible effect on risk level of the portfolio with the inclusion of Sukuk bond along with the Euro bond in the portfolio. In order to measure the risk level, VaR (Value at Risk) technique with Delta Normal approach is used. A sample of 5 countries; Malaysia, Bahrain, Pakistan, Bermuda and UAE is taken for study. For the analysis two portfolios are constructed for each country. In one portfolio both the Sukuk and Euro bonds are included while in other portfolio only Euro bonds are included in order to determine the risk level of both the portfolio. On the basis of values of VaR, it is concluded that inclusion of Sukuk bond in a portfolio along with Euro bond decrease the risk level of the portfolio. Thus Sukuk are different types of securities than Euro bonds and diversify the risk much more than the Euro bonds (Ariss & Weill, 2011; Cakir and Raei, 2007). This study aimed at studying the risk level because risk is one of the most important factors for investor in taking the investment decision and it goes side by side with return. As according to the Markowitz portfolio theory, if there are two portfolios with same expected return, the investor will go for the portfolio that is less risky. The investor will accept more risk only in a case of some increased expected return (Marling and Emanuelsson, 2012).

This study includes six sections: section 1 presents the introduction of the study. The literature review of the similar studies conducted by the previous researchers is presented in the section 2. Section 3 will cover the data and methodology part of the study. Section 4 will be about analysis and findings. The conclusion and recommendation will be presented in the section 5. The last section is based on appendices.

Literature Review

With the introduction of Sukuk bonds in the bond market, two basic questions were raised. First, is there any difference between Sukuk (Islamic bond) and corporate bond (conventional bond). Second, how Sukuk can be beneficial for an investor while making investment decision. A lot of research was conducted in this area. The research conducted by Saripudin, Mohamad, Razif, Rosli & Ahmad (2012) to determine the possible differences between the two important types of bonds; Sukuk and conventional bonds. For this purpose YTM (yield to maturity) is analyzed for

the period of 2001 to 2012 through paired sample t-test and Granger causality. The study concluded that by issuing Sukuk, the beta risk of that firm is significantly affected. Thus Sukuk are the new type of financial instruments and they are not simply bonds. The advent of Sukuk Islamic bonds has given rise to new era in financial world due to which a new way of achieving financial stability has obtained (Shaikh and Saeed, 2010).

Shahida and Saharah (2013) found the reasons that why firms issue Sukuk rather than conventional bonds in Malaysia. The variables studied include issuance experience, capital investment, market to book ratio, firm size, past bonds, return on asset and past Sukuk issuance experience. In methodology 2SLS, pooled regression, fixed effect and random effect model were applied on 79 listed firms over the time period of 2001 to 2010. Three factors that are past Sukuk issuance experience, tax incentives and firm sizes were found significant in explaining determinants of firm to issue the Sukuk as compared to conventional bond.

According to Usmani (2007) nowadays Sukuk is similar to conventional bonds in term of lacking right of ownership, fixed return right and guaranteed principal repayment. But opposite results were obtained by Godlewski, Turk-Ariss and Weill (2010) in their study conducted in Malaysia while analyzing 77 Sukuk and 93 conventional bonds. It was found that these two types of bonds are different from each other especially in term of reaction of the stock market to the announcement of these bonds issues. Stock market reacts negatively to the announcement of the Sukuk issues but gives neutral reaction for the issue of conventional bond. They also found better operating and financial position of the companies that issue conventional bonds as compared to the companies that issue Sukuk bonds. Thus it was concluded that market do not react in the same way to both type of bonds and therefore Sukuk and conventional bonds cannot be considered as same. Regarding the reaction of stock market towards the Sukuk issues, Ahmad and Rusgianto (2013) found opposite results. They found that stock market reaction is positive but insignificant towards the issue of Sukuk bonds. The difference of their results from the previous studies may be due to the fact that they conducted an event study and examined the post crises reaction of the stock market towards the Sukuk issue. Same results were also supported by Arif and Safari (2012). They found in their study some similarity of Sukuk with Conventional bonds due to which Sukuks are usually referred as Islamic bonds. But they concluded with the fact that Sukuks are

quite different from conventional bonds. The study was conducted on the basis of yield to maturity. Along with this causality was also tested between these two types of bonds on the basis of Granger causality test. They did not find any significant causal relationship between Sukuk and conventional bonds. It was found that beta of the firm is significantly changed by issuance of the Sukuk. A research given by Ahmad and Rusgianto (2013) examines the post crises reaction of the stock market towards the Sukuk issues in Malaysia. An event study methodology with CAAR was conducted on a sample of 29 companies for the period of 2009 to 2010. It was found that the reaction of stock market to the Sukuk issues was positive but insignificant. Sukuk shows the real economic strength and economic activities of the company. The same methodology was also employed by Ahmad and Rahim (2013) in order to study the stock market reaction toward the different rating announcements on the issuance of Sukuk in Malaysia over the time period of 2004 to 2011. The significantly positive reaction of market was found on the Sukuk announcement for highest quality and excellent rating. While negative reaction of the market was found for the issuance of conventional bond.

An empirical study of Cakir and Raei (2007) compares Sukuk with Euro bonds through value at risk from 2000 to 2007 for four countries that are Pakistan, Qatar, Bahrain and Malaysia. For VaR methodology, they collected clean price data. For analysis, Monte-Carlo simulation and delta-normal approach were used in the methodology. It was concluded that as compared to the conventional Euro bonds, Sukuk are different types of financial instruments. The portfolio that contained Sukuk along with the conventional bonds significantly reduced the VaR of the portfolio as compared to the portfolio that contained only conventional bonds. By including Sukuk in a portfolio, holdings are diversified which lead to a reduction in the risk created by the financial institutions (Segaf, 2012; Hassan, 2012; Fenech and Watson, 2009; Godlewski, Ariss & Weill, 2011).

Segaf (2012) studied the effect of financial crises (2008) on Sukuk and conventional bond in Malaysia. It was found that Sukuk bonds have more stable income; asset backed tradable Shariah compatible certificates. Sukuk bonds are less affected by financial crises as compared to conventional bonds. The inclusion of Sukuk bonds in the portfolio diversifies the risk much than only conventional bonds in the portfolio.

Rauf (2008) studied the Sukuk bonds in term of their usefulness and their growth. With empirical evidences he presented the result that though Sukuk bonds are new borne as compared to conventional bonds but due to their Islamic basis they are highly demanding in Islamic countries. Along with this they are spreading more quickly in west as well.

Mosaïd and Boutti (2014) also compared Sukuk bond portfolio and conventional bond portfolio. Index of series TR BPAM ALL BOND INDEX was used over time span of 2007 to 2012. It was found that Sukuk index performs much better than conventional bond index and the market index. Along with this a positive and significant correlation was found between Sukuk returns and bond portfolio returns. A similar study by Fathurahman & Fitriati (2013) compared the Sukuk and euro bond on the basis of yield to maturity. The study was done on the population of 243 bonds well with fixed as well as floating interest rate. The population was further classified into ten sample's groups. Each group contained was 31 bonds. The average, correlation coefficient, standard deviation, portfolio covariance and independent t test applied for the comparison. It was concluded from the study that overall there is a significant difference between average of Sukuk and conventional bond.

Tariq (2004) examined the management of the financial risk of the Sukuk structure. Notably market risk (interest rate risk and exchange rate risk), Shariah compliance risk, credit risk and support and operational risk (default risk, coupon payment risk, and specific risk investors) were explained. It was found that Sukuk bonds are different from conventional bonds. On the contrary, Wilson (2008) found that Sukuk are identical to the conventional bonds.

Miller, Challoner, and Atta (2007) conducted a research in order to determine the main difference between Sukuk and conventional bond. They found that Sukuk are structured to generate the same return as that by the conventional bond. The difference is that the return generated from the conventional bond is obtained from the interest to be paid whereas the return on Sukuk is obtained from the underlying asset.

Among Sukuk and conventional bonds, which one is more risky and also whether the risk measurement and management strategies of conventional bonds can be applied for Sukuk bond as well?; Sayed (2013). Findings suggest that Islamic finance is based on the justice i.e.; equal distribution of the financial resources

while conventional financial system is deprived of it. The conventional risk measurement tool (variance and beta) and management tools (hedging and diversification) are three main tools for the Sukuk bonds as well but the Shariah rules and principles must be kept in front.

Alam (2007) investigated the effect of the announcement of Sukuk and conventional bond on the wealth of shareholder and their determinants. For the study, a sample of 87 conventional bonds and 79 Sukuks was taken from Qatar, UAE, Pakistan, Malaysia, Bahrain, Singapore and Indonesia. The time period for the study was divided into three phases; Pre-crises phase (2004 to 2006), during- crises phase (2007 to 2009) and Post-crises phase (2010 to 2012). A market model event study was applied for the calculation of the abnormal return which was used in calculation of CAAR. Along with this multivariate regression was used. It was found that market reacted negatively towards the Sukuk announcement in the Pre-crises and During-crises phase. Whereas market reacted positively towards the conventional bond announcement in the Pre-crises phase and reacted negatively in the During-crises and Post- crises phase. Thus it is concluded that Sukuk announcement negatively affects the value of firm in short run while conventional bond announcement has positive effect on the value of firm in all the phases except the post crises phase.

Rauf and Ibrahim (2014) examined different types of risk related with Sukuk structure and their effect on returns on the Sukuk in market. The data of 2282 observations of each index closed values was analyzed by OLS and multiple regression models. Three dependent variables NASDAQ Dubai return of GCC Sukuk, NASDAQ Dubai return of GCC financial Sukuk and NASDAQ Dubai return of GCC corporate Sukuk were used. It was concluded that different types of risks i.e., liquidity risk, operational risk, market risk and credit risk has significant effect on the return of Sukuk. Mehmood, Razaq & Haral (2010) also found that return on Sukuk is significantly affected by different types of risk including liquidity risk and Shariah compliance risk (operational risk). Razaq (2010) found that Sukuk market has legal risk. Thus these findings show that different risks are associated with Sukuk market.

Ahmad and Radzi (2011) investigated the sustainability of the Sukuk and conventional bond during the recent financial crises in Malaysia. Three variables are considered namely market liquidity, GDP and foreign exchange. OLS (ordinary least square)

is applied and it was concluded that foreign exchange is the major cause for the issuance of both Sukuk as well as conventional bond. Along with this it is also found that issuance of the conventional bond as compared to Sukuk is not sensitive to economic conditions (market liquidity and GDP). Daud and Kefeli (2012) also found that Sukuk issuance in Malaysia is significantly affected by GDP. Abdullah, Yazid, Abdullah & Kamarudin (2014) highlighted the risk associated with the funding of infrastructure projects by issuing Sukuk. It was found that Sukuk as compared to conventional bond is less risky in funding the infrastructure projects.

Rezaei (2013) also found that as compared to the conventional bond, Sukuk is a useful instrument for financing government agencies and private companies. Saad and Haniff (2013) explained the performance of Sukuk issuing public listed companies as compared to the conventional bond in Malaysia through multivariate regression and independent T test. It was found that Sukuk has emerged as an acceptable alternative to the conventional bond in fund raising and 49.4 percent of fund raising in PDS (private debt securities) market in 2004 was done through Sukuk. Thus majority of issuance is Sukuk (Muhammad and Adrian, N/A).

Afshar (2013) made comparison between Sukuk and conventional bond on the basis of risk and return features as well as the structure. It was concluded that Sukuk is an ideal choice for all those investors who wish to respect the Shariah principles. Rizvi (2014) found the scope for the Islamic bond or Sukuk in India. It was noticed that there is a wide scope for Sukuk in India due to the two factors that are internal demand and external supply.

Diaw, Bacha and Lahsasna (2011) conducted a research in which first a GDP-linked Sukuk model is proposed and then it investigates the potential benefits and hurdles related with GLS (GDP-linked) Sukuk model. The study was based on the risk return profile and Forward Ijarah. In this study data of five countries Algeria, Malaysia, Senegal, Bahrain and Uzbekistan was taken from year 1969 to 2009. It was found that in case of the infrastructure projects (non-revenue generating) GDP-linked Sukuk is an effective instrument. GLS provide an opportunity to the governments of Islamic countries to bring diversification of fund raising as well as to address the issue of Sukuk benchmarking against interest rate (c and Shiller, 2009). Ramasamy et al. (2011) also found that Sukuk bonds as compared to conventional bonds

are less risky and generate more yield return to the investor (Nanaeva, 2010; Zin et al., 2011; Rauf & Ibrahim, 2014).

Our study evaluates the financial performance of Sukuk and Euro bonds. It is conducted with the aim of determining the possible effect on the risk level of a portfolio containing both Sukuk and Euro bonds as compared to the portfolio containing only Euro bond. Results will determine which portfolio can generate the maximum return at optimal level of risk for the institutional investor.

Methodology

The population of this study is restricted to the bond market of that specific country whose data was available (convenience sampling). The data used in this study is secondary in nature. The daily returns data for bonds i.e.; Sukuk and Euro, is obtained from the DataStream of five countries including Pakistan, Bahrain, Malaysia, Bermuda and UAE. Different time periods are selected for each country due to unavailability of the data. For Malaysia the time period is from 2010 to 2012, for Bahrain the time period is from 2010 to 2012, for Pakistan the time period selected is from 2008 to 2010, for Bermuda the time period is from 2010 to 2013 and for UAE the time period is from 2011 to 2013.

VaR methodology is selected in order to determine whether the introduction of Sukuk bonds in a portfolio brings any change in the level of risk for the investors. VaR (Value at Risk) is the measurement of the worst expected loss of a portfolio over a specific holding period at certain confidence level, under the normal market conditions (Jorion 2006). According to Cakir and Raei (2007), “VaR expresses the market risk of the portfolio and represents the maximum amount of loss in a holding period. For example VaR method can be stated with either 1% probability or 99% confidence level that a certain amount will be lost in a specific day, month or year. VaR is based on return’s variance of the portfolio.”

$$\sigma = w \Sigma w' \text{-----}$$

----- (1)

Where

w = weights ‘vector for different securities in a portfolio
w’ = weights’ transposed vector in a portfolio

Σ = the variance-covariance matrix of the securities' return in a portfolio

The portfolio VaR can be computed from the combination of risks of the various Securities in the portfolio. There are various methods for computing the VaR like Delta- normal approach, Monte-Carlo simulation technique etc. The Delta-normal approach or the variance-covariance approach is one of the most commonly used methods for the computation of VaR this method is based on the following basic equation.

$$\text{VaR}_p = - (\mu_p - \alpha \sigma_p W) \text{-----}$$

----- (2)

Where

α = the standard normal deviate

μ_p = portfolio's average return

W = initial portfolio value

The above equation shows that lower volatility leads to smaller VaR. In case of portfolio of the assets; if the asset's returns have smaller or negative correlation then it leads to lower volatility. In this study VaR is calculated for equally weighted portfolios at significance level of 99% with the holding period of 5 days as there are 5 working days in a week. Basically two portfolios are made for each country. The portfolio 1 contains both Sukuk and Euro bonds and the portfolio 2 contains only Euro bond with an equal investment of US\$100,000,000 in each portfolio. The equal investment of US\$100M is taken on the basis of previous literature.

Table given in Appendix includes all those Sukuk and Euro bonds along with their issuer name, issuer date, maturity period and issue size that are taken under study.

Data Analysis and Results

In this study, the daily returns data of Sukuk and Euro bonds is obtained from the Data Stream for each country. Different time period is selected for each country in order to make sure the availability of relevant data (Daily Returns) for each bond (Sukuk bond and Euro bond) in that specific time period. The daily returns data is then converted to weekly returns data (5 days) for better results. The VaR of each portfolio is calculated at 99 % confidence level. For each country two hypothetical portfolios are made. One portfolio contains both Sukuk and Euro bonds, whereas the other

portfolio contains only Euro bonds. Equally weights are assigned to all the bonds in a portfolio with the assumption of equal investment of US\$100,000,000 in each portfolio.

Table 1. *Correlation matrix*

| MALAYSIA | | | | |
|-----------------|--------|----------|----------|--------|
| | Sukuk | Sukuk | Bond 1 | Bond 2 |
| | Sukuk | 1 | | |
| | Bond 1 | -0.0019 | 1 | |
| | Bond 2 | 0.112431 | 0.132626 | 1 |
| BAHRAIN | | | | |
| | Sukuk | Sukuk | Bond 1 | Bond 2 |
| | Sukuk | 1 | | |
| | Bond 1 | 0.050902 | 1 | |
| | Bond 2 | 0.093275 | -0.02864 | 1 |
| PAKISTAN | | | | |
| | Sukuk | Sukuk | Bond 1 | Bond 2 |
| | Sukuk | 1 | | |
| | Bond 1 | 0.050902 | 1 | |
| | Bond 2 | 0.093275 | -0.04739 | 1 |
| BERMUDA | | | | |
| | Sukuk | Sukuk | Bond 1 | Bond 2 |
| | Sukuk | 1 | | |
| | Bond 1 | 0.140906 | 1 | |
| | Bond 2 | -0.1829 | 0.047425 | 1 |
| UAE | | | | |
| | Sukuk | Sukuk | Bond 1 | Bond 2 |
| | Sukuk | 1 | | |
| | Bond 1 | -0.05032 | 1 | |
| | Bond 2 | -0.03977 | -0.12378 | 1 |

Firstly, the correlation between the different bonds in a portfolio is determined as given in the table 1. The correlation value shows the extent to which the two securities are correlated. Its value ranges between -1 and +1. The -1 value shows perfect negative correlation. It means that the two securities are perfectly negatively correlated to each other. If one security moves up in value the other security will move down and vice versa. If the correlation value is +1 then it means that the two securities are perfectly positively correlated. It means that if one security moves up in value then the other security will also moves up and vice versa. The correlation value 0 shows that there is no correlation exists between two securities. In the above table, for Malaysia, the

correlation between Sukuk and Bond 1 is (-0.0019) insignificantly negative. The correlation value for Sukuk and Bond 2 is (0.1124) insignificantly positive. The correlation value between Bond 1 and Bond 2 is (0.1326) insignificantly positive. The correlation between Sukuk and Bond 1 for Bahrain is (-0.07154) insignificantly negative. The correlation value for its Sukuk and Bond 2 is (0.399544) insignificantly positive. The correlation value between its Bond 1 and Bond 2 is (-0.02864) insignificantly negative. The correlation between Sukuk and Bond 1 for Pakistan is (0.050902) insignificantly positive. The correlation value for its Sukuk and Bond 2 is (0.093275) insignificantly positive. The correlation value between its Bond 1 and Bond 2 is – (0.04739) insignificantly negative. The correlation between Sukuk and Bond 1 for Bermuda is (0.140906) insignificantly positive. The correlation value for its Sukuk and Bond 2 is (-0.1829) negative. The correlation value between its Bond 1 and Bond 2 is (0.047425) insignificantly positive. The correlation between Sukuk and Bond 1 for UAE is (-0.05032) insignificantly negative. The correlation value for its Sukuk and Bond 2 is (-0.03977) insignificantly negative. The correlation value between its Bond 1 and Bond 2 is (-0.12378) insignificantly negative. So overall, all the correlation results either positive or negative are not significant which means that such securities (Sukuk and Euro) in each portfolio are not significantly correlated with each other.

The second tool applied is covariance matrix. The covariance between two securities is determined by calculating the weighted sum of product of deviation of the securities.

Table 2. *Covariance matrix*

| MALAYSIA | | | |
|----------|-----------|------------|-----------|
| | Sukuk | Bond 1 | Bond 2 |
| Sukuk | .0000552 | -.0000465 | .0000118 |
| Bond 1 | -.0000465 | .000118 | .00001931 |
| Bond 2 | 0.0000118 | 0.00001931 | 0.000194 |

| BAHRAIN | | | |
|---------|------------|-------------|-------------|
| | Sukuk | Bond 1 | Bond 2 |
| Sukuk | .0000493 | -.00000134 | .0000240 |
| Bond 1 | -.00000134 | .0000125 | -.000000633 |
| Bond 2 | .0000240 | -.000000633 | .0000730 |

| PAKISTAN | | | |
|----------|-------|--------|--------|
| | Sukuk | Bond 1 | Bond 2 |

| | | | |
|----------------|--------------|--------------|------------|
| Sukuk | .0000428 | .0000122 | .0000103 |
| Bond 1 | .0000122 | .001312 | -.000028 |
| Bond 2 | .0000103 | -.000028 | .000278 |
| BERMUDA | | | |
| | Sukuk | Bond 1 | Bond 2 |
| Sukuk | .00000530 | .000001746 | -.00000409 |
| Bond 1 | .000001746 | .00002048 | .0000205 |
| Bond 2 | -.00000409 | .0000205 | .0000973 |
| UAE | | | |
| | Sukuk | Bond 1 | Bond 2 |
| Sukuk | .00007072 | -.0000008020 | .00000612 |
| Bond 1 | -.0000008020 | .0000307 | -.0000184 |
| Bond 2 | .00000612 | -.0000184 | .000984 |

The above table presents covariance between the bonds. In case of Malaysia, the positive covariance values of Sukuk and bond 2 shows that these two are in the same direction if Sukuk bond return moves up then bond 2 return will also moves up with the same amount. The Sukuk and bond 1 have negative covariance value it shows that these two are in opposite direction if Sukuk bond return moves up then bond 1 return will moves down with the same amount. Bond 2 and bond 1 also have positive value so it will also have the same effect.

In case of Bahrain, the positive covariance values of Sukuk and bond 2 show that these two are in the same direction. The Sukuk and bond 1 have negative covariance value it shows that these two are in opposite direction. Bond 2 and bond 1 also have negative value so it will also have the same effect.

In case of Pakistan, the positive covariance values of Sukuk with bond 1 and bond 2. Whereas negative covariance exists between Bond 2 and bond 2. In case of UAE, the covariance values of Sukuk and bond 1, and sukuk with bond 2 is negative and positive respectively. Bond 2 and bond 1 also have negative value.

Finally, the table below presents VaR value for each portfolio in each country. VaR is basically the maximum expected loss that may occur to an investor in a portfolio in a holding period. VaR is basically a tool for measurement of risk. The value of VaR shows the risk level of a portfolio. In this study, VaR is calculated through Delta Normal approach for the holding period of 5 days, at the confidence level of 99%.

Table 3. VALUE AT RISK (VaR) OF PORTFOLIOS Holding period = 5 days, $\alpha = 99\%$ (2.33)

| | PORTFOLIO 1 (Conventional bonds + Sukuk) | PORTFOLIO 2 (Conventional bonds) |
|-----------------|---|---|
| MALAYSIA | | |
| MEAN | 3.21% | 3.22% |
| VARIANCE | 0.0000476466 | 0.0000876926 |
| S.D | 0.006902653 | 0.009364433 |
| VAR | 1.14% | 1.54% |
| BAHRAIN | | |
| MEAN | -5.36% | -4.89% |
| VARIANCE | 0.0000199098 | 0.000021071 |
| S.D | 0.004462036 | 0.004590311 |
| VAR | 0.73% | 0.76% |
| PAKISTAN | | |
| MEAN | 0.05% | 0.06% |
| VARIANCE | 0.000180164 | 0.000383389 |
| S.D | 0.01342251 | 0.019580311 |
| VAR | 2.20% | 3.22% |
| BERMUDA | | |
| MEAN | -3.61% | -2.93% |
| VARIANCE | 0.00001.36105 | 0.00003.04711 |
| S.D | 0.003689246 | 0.005520066 |
| VAR | 0.61% | 0.91% |
| UAE | | |
| MEAN | -0.17% | -0.19% |
| VARIANCE | 0.000114939 | 0.000244396 |
| S.D | 0.010720975 | 0.015633156 |
| VAR | 1.76% | 2.57% |

VaR is calculated to make comparison between the two portfolios to determine the less risky portfolio. In one portfolio Sukuk and Euro, both types of bonds are included and in other portfolio, only Euro bonds are included. In case of Malaysia, the VaR value (1.14%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 1.14% which is less than the VaR value (1.54%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bond is less risky as compared to the portfolio containing only Euro bonds. In case of Bahrain, the VaR value (0.73%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 0.73% which is less than the VaR value (0.76%) of the portfolio containing only Euro bonds. It means that portfolio containing both

Sukuk and Euro bond is less risky as compared to the portfolio containing only Euro bonds. In case of Pakistan, VaR value (2.20%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 2.20% which is less than the VaR value (3.22%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing both Sukuk and Euro bonds. In case of Bermuda, VaR value (0.61%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 0.61% which is less than the VaR value (0.91%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing only Euro bonds. In case of UAE, VaR value (1.76%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 1.76% which is less than the VaR value (2.57%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing only Euro bonds.

Results

In this study, as sample of five countries is taken. For each country the daily returns data of Sukuk and Euro bonds is obtained from the DataStream. Time period under study for each country is different because of the availability of relevant data (Daily Returns) for each bond (Sukuk bond and Euro bond). On the basis of weekly returns data two hypothetical portfolios are made for each market. One portfolio contains both Sukuk and Euro bond, while the other portfolio contains only Euro bonds. Equally weights are assigned to all the bonds in a portfolio with the assumption of equal investment of US\$100,000,000 in each portfolio. Through Delta Normal approach VaR is calculated for each portfolio and made a comparison of risk level between the two portfolios on the basis of VaR. This is done so in order to study and determine any effect on risk level by including Sukuk bond in the portfolio.

This study concluded that both the hypotheses i.e., H1 and H2 are rejected in case of all the countries included in the sample. In case of Malaysia, the VaR value (1.14%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 1.14% which is less than the VaR value

(1.54%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bond is less risky as compared to the portfolio containing only Euro bonds. In case of Bahrain, the VaR value (0.73%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 0.73% which is less than the VaR value (0.76%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bond is less risky as compared to the portfolio containing only Euro bonds. In case of Pakistan, VaR value (2.20%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 2.20% which is less than the VaR value (3.22%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing both Sukuk and Euro bonds. In case of Bermuda, VaR value (0.61%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 0.61% which is less than the VaR value (0.91%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing only Euro bonds. In case of UAE, VaR value (1.76%) shows that the maximum expected loss for the investor in such portfolio containing both Sukuk and Euro bonds is 1.76% which is less than the VaR value (2.57%) of the portfolio containing only Euro bonds. It means that portfolio containing both Sukuk and Euro bonds is less risky as compared to the portfolio containing only Euro bonds.

Thus it is concluded that as compared to the conventional Euro bonds, Sukuk are different types of financial instruments. VaR value is significantly affected by including Sukuk bonds in a portfolio and its value decreases with the inclusion of Sukuk bond in a portfolio. Thus by including Sukuk in a portfolio, holdings are diversified. (Segaf, 2012; Hassan, 2012; Fenech and Watson, 2009; Godlewski, Ariss & Weill, 2011; Cakir and Raei, 2007).

Conclusion and Recommendations

The study is conducted on the evaluation of the financial performance of Sukuk and Euro bond. Portfolios with and without *sukuks* are constructed to determine the comparative risk level by using VaR measurements. Delta Normal approach of VaR found that inclusion of Sukuk in a portfolio significantly affects the risk level of the portfolio. In case of all the countries included in a

sample that is Malaysia, Bahrain, Pakistan, Bermuda and UAE, the VaR value significantly decreased with the inclusion of Sukuk bond in the portfolio along with the Euro bond. Thus holdings can be diversified with the addition of Sukuk bond in a portfolio along with the Euro bonds (Segaf, 2012; Hassan, 2012; Fenech and Watson, 2009; Godlewski, Ariss & Weill, 2011; Cakir and Raei, 2007). In future, the results of the study on Sukuk and Euro bond's financial performance can be made more reliable by increasing the time period and the sample size. Along with this by applying other methods of calculating VaR, interesting results can be generated.

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Appendix

Characteristics of Sukuk and Euro bonds

MALAYSIA

| | | | |
|-------------------------------|------------|---------|------------------|
| Malaysian Global Sukuk | 25/06/2002 | 5 years | USD 600,000,000 |
| Rafflesia Capital LTD | 4/10/2006 | 5 years | USD 750,000,000 |
| Cherating Capital LTD | 5/7/2007 | 5 years | USD 8500,000,000 |

BAHRAIN

| | | | |
|------------------------------|------------|----------|-----------------|
| CCBB INTL.SUK | 5/7/2001 | 90 days | USD 100,000,000 |
| PCFC DEVELOPMENT | 29/9/2005 | 10 years | USD 400,000,000 |
| BAHRAIN 2003 (Bond 1) | 21/01/2003 | 5 years | USD 500,000,000 |

PAKISTAN

| | | | |
|-------------------------------------|------------|---------|-----------------|
| Pakistan International Sukuk | 18/01/2005 | 5 years | USD 600,000,000 |
|-------------------------------------|------------|---------|-----------------|

| | | | |
|---------------------------------------|-----------|----------|-----------------|
| International bonds: Pak, 2006 | 3/30/2006 | 10 years | USD 300,000,000 |
| International bonds: Pak, 2007 | 6/1/2007 | 10 years | USD 750,000,000 |

BERMUDA

| | | | |
|-----------------------------|------------|----------|-----------------|
| GE Capital Sukuk Ltd | 27/11/2009 | 5 years | USD 500,000,000 |
| CBQ Finance Ltd | 18/11/2009 | 5 years | USD 100,000,000 |
| Int bonds: Bermuda | 7/3/2012 | 10 years | USD 475000000 |

UAE

| | | | |
|--------------------------|------------|---------|-----------------|
| ADIB Sukuk Co LTD | 12/12/2006 | 5 years | USD 800,000,000 |
| Mashreq bank PSC | 4/6/2006 | 5 years | USD 300,000,000 |
| Emirates Airlines | 24/3/2004 | 7 years | USD 500,000,000 |
